AG IN THE CLASSROOM - HELPING THE NEXT GENERATION UNDERSTAND THEIR CONNECTION TO AGRICULTURE

SPECIALTY CROPS

Specialty crops are fruits, vegetables, dried fruit, tree nuts, and nursery crops (including flowers). Examples of these crops in Colorado include potatoes, lettuce and apples.

When people think of Colorado, outdoor fun in the Rocky Mountains is what usually comes to mind. But Colorado is so much more.

Nearly half of Colorado's 66 million acres are farms and ranches. They contribute about $16 billion to Colorado's economy each year. Agriculture helps feed the nation and the world. It also provides wildlife habitat, and protects the environment.

What is Colorado Proud?

Colorado Proud was developed in 1999 to help people identify and buy Colorado food and agricultural products.

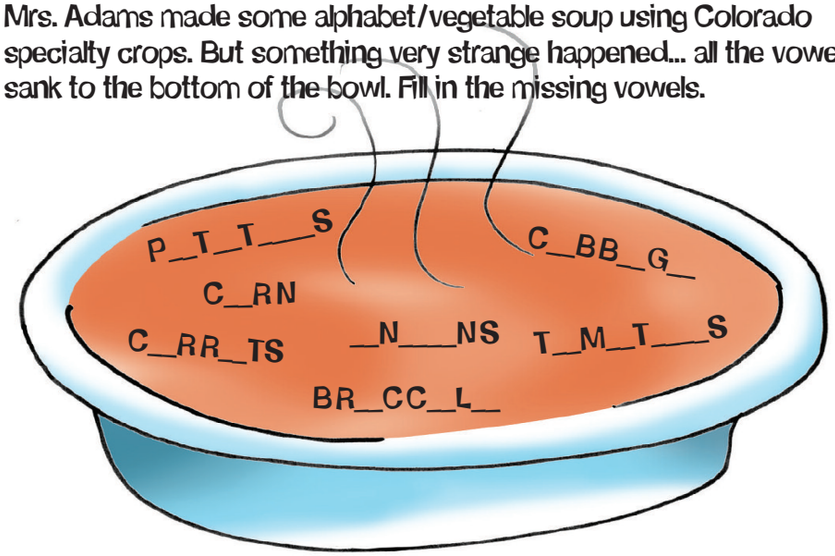
Why Local is Better.

Buying products grown or produced in Colorado guarantees freshness. They are fresher because they are harvested and delivered immediately. So they are healthier and have more flavor. They don't have to be stored and transported from out-of-state. So local is better for the environment because we save the fuel that would be used to transport it. Look for the mountain and sun Colorado Proud label (below) and ask for Colorado products wherever you are.

COLORADO PROUD™
coloradoproud.org

Colorado Proud. Better for you. Better for Colorado.

Mrs. Adams made some alphabet/vegetable soup using Colorado specialty crops. But something very strange happened... all the vowels sank to the bottom of the bowl. Fill in the missing vowels.



Words to Know

When we talk about crops there are some new words you should learn. ***Production*** means the total amount produced. It is usually measured in pounds or tons. For example we could say "Colorado produces 2.4 billion pounds of potatoes each year."

Value or ***Value of Production*** is another concept. It means what a crop is worth. It is measured in dollars and cents. An example of value of production is, "In 2005, Colorado potatoes produced a total value of $213.9 million." So the crop of 2.4 billion pounds was worth $213.9 million. They are both measurements, but measurements of different things.

Potatoes

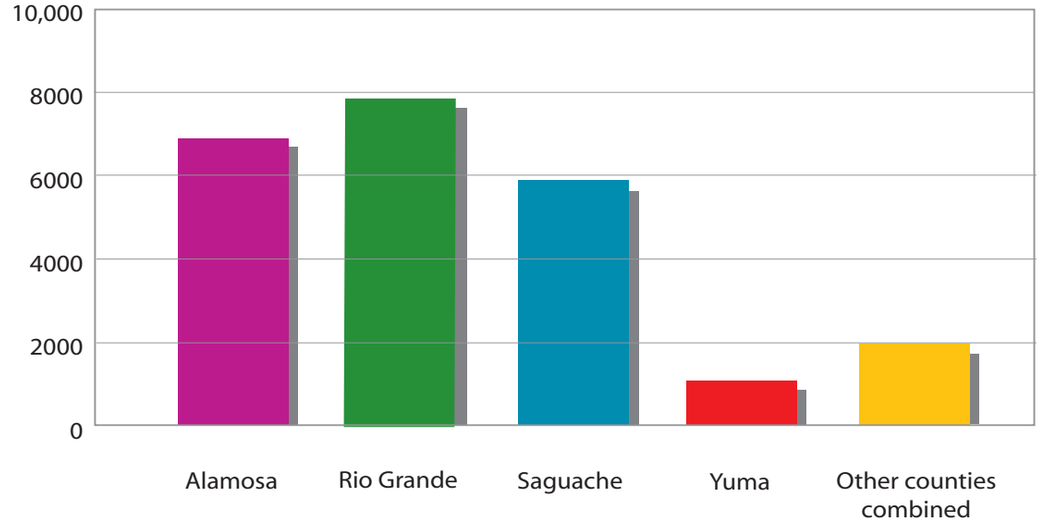
Do you like french fries with your hamburger? Good! Colorado has you covered! Ranked fifth in the U.S. for the production of potatoes, Colorado produces 2.4 billion pounds of potatoes each year.

Most of Colorado's potato crop is grown in the San Luis Valley, a very fertile, high-altitude basin in south-central Colorado. The valley is nestled between the Sangre de Cristo and the San Juan mountains. Farmers began growing potatoes in the Valley in the late 1800s, making it one of the oldest potato growing regions in the country.

With different varieties and storage, Colorado potatoes are available year-round. The fall crop is grown primarily in Alamosa, Rio Grande, and Saguache counties. The summer crop is grown primarily in Yuma county in east central Colorado.

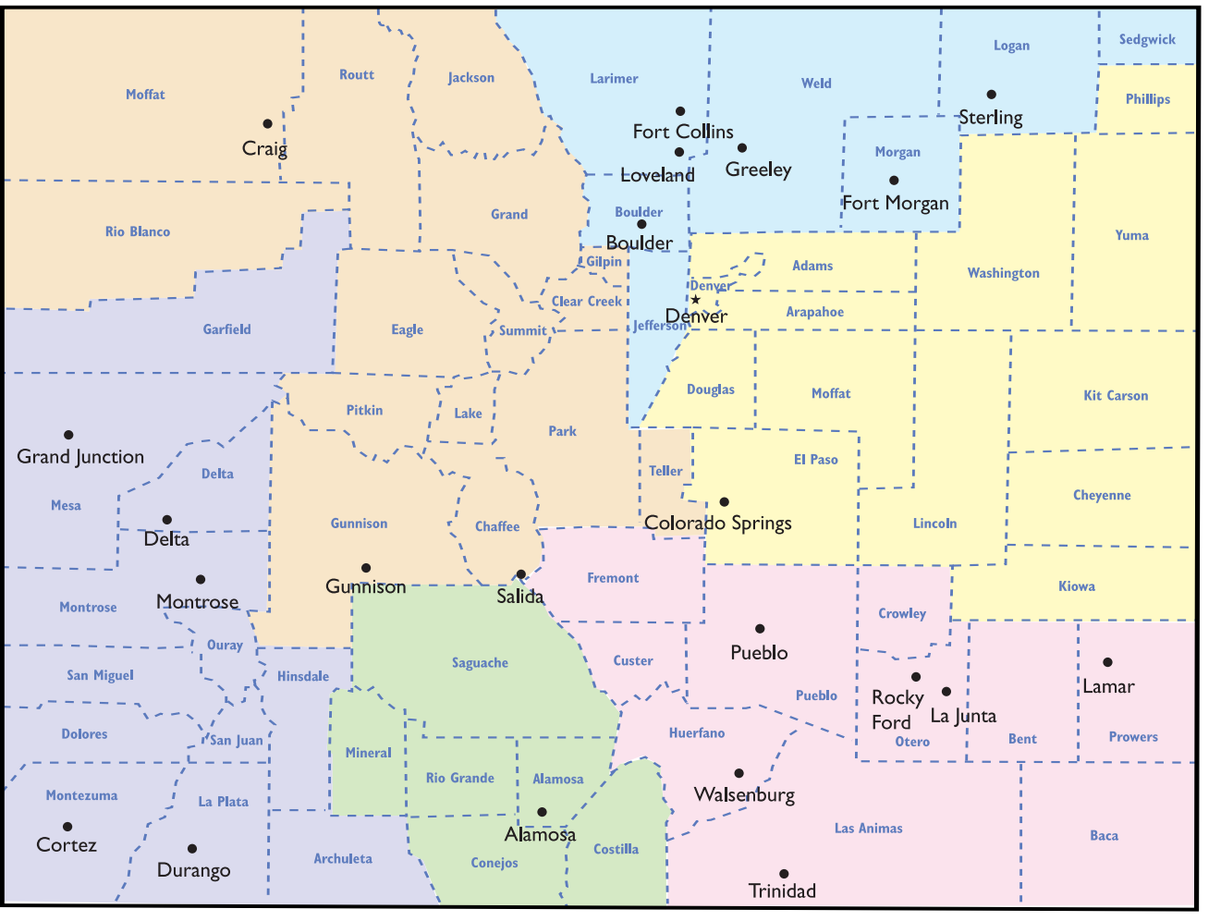
In 2006, Colorado potatoes had a total value of $201.8 million. In 2006, 64,000 acres were planted in potatoes. The crop was smaller (in total production) than the 2005 crop. This is due to reductions in available irrigation water.

Potato production by county, Colorado 2005-2006
Measured in 1 million pounds

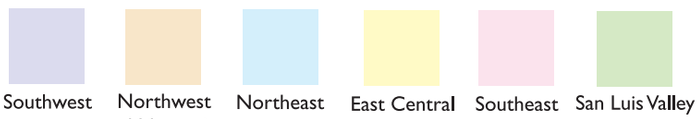


Potatoes are very nutritious. They are naturally fat free, sodium free, a good source of fiber, high in potassium, and high in Vitamin C. Look for a variety of Colorado potatoes including: Yukon Gold, Russet, Fingerling and Purple year-round at your grocery store, farmers' market or restaurant.

In October 1995, the potato became the first vegetable grown in space. NASA experimented with growing potatoes in space with the goal of feeding future astronauts on long voyages or future space colonies.



Colorado Agricultural Regions



Using the bar chart above and the map to the left, answer the following questions:

1. What agricultural region in Colorado produced the most potatoes from 2005-2006?

2. What region produced the second most potatoes?

3. According to the article and bar chart, are there more summer or fall potatoes grown in Colorado?

COLORADO VEGGIES

Some of the Colorado counties that are big vegetable producers include: Adams, Bent, Boulder, Lamar, Larimer, Prowers, Pueblo, and Weld counties.

Broccoli

You can count on your local grocery store, farmers' market and restaurants to provide Colorado grown broccoli. It is naturally low in fat and sodium and high in vitamin C and vitamin B9 (folate). It's also a good source of fiber, potassium, calcium, magnesium, iron, zinc, vitamin A, B vitamins, and vitamin K. Fresh Colorado broccoli can be found from July through mid-October.

Tomatoes

Tomatoes are low in fat, high in vitamins A and C, very low in sodium and a good source of potassium, magnesium, iron, zinc and fiber. In addition, processed tomatoes (used in ketchup, spaghetti and pizza sauce) contain lycopene. Lycopene helps prevent certain kinds of cancer, heart disease and some very serious eye diseases as well.

Look for fresh Colorado tomatoes mid-July through mid-October and greenhouse tomatoes year-round.

Asparagus

Asparagus is an early season crop, harvested in Colorado during the month of May and early June.

Asparagus contains high levels of vitamin A, vitamin C, vitamin E, vitamin B9 (folate) and fiber. They are a good source of B vitamins, phosphorus, and calcium. These nutrients play an important role in the fight against cancer. Asparagus is also low in fat and sodium, making it the perfect choice for a healthy heart. It also helps you fight sickness by boosting your immune system.

Carrots

Comprising about 10% of our total vegetable crop value, the Colorado carrot crop is the third largest in the nation.

Carrots are low in sodium, fat free, high in vitamin A and a good source of vitamin C, B vitamins, vitamin D, vitamin E, vitamin K, as well as calcium and phosphorous.

Look for Colorado carrots at your local grocery store or farmers' market from August through November.

The school cook is sick today and the principal would like you to plan lunch using the most nutritious vegetable above. Using the checklist below, find out which vegetable has the most nutrients and write a suggestion for a recipe or how to serve the vegetable for the school lunch. Use complete sentences with proper capitalization, punctuation and spelling.

	vitamin A	B vitamins	vitamin B9 (folate)	vitamin C	vitamin D	vitamin E	vitamin K	high fiber	low fat or fat free	low sodium	calcium	iron	magnesium	phosphorous	potassium	zinc	Totals
broccoli																	_____
tomatoes																	_____
asparagus																	_____
carrots																	_____

My suggestion: _____

_____

_____

_____

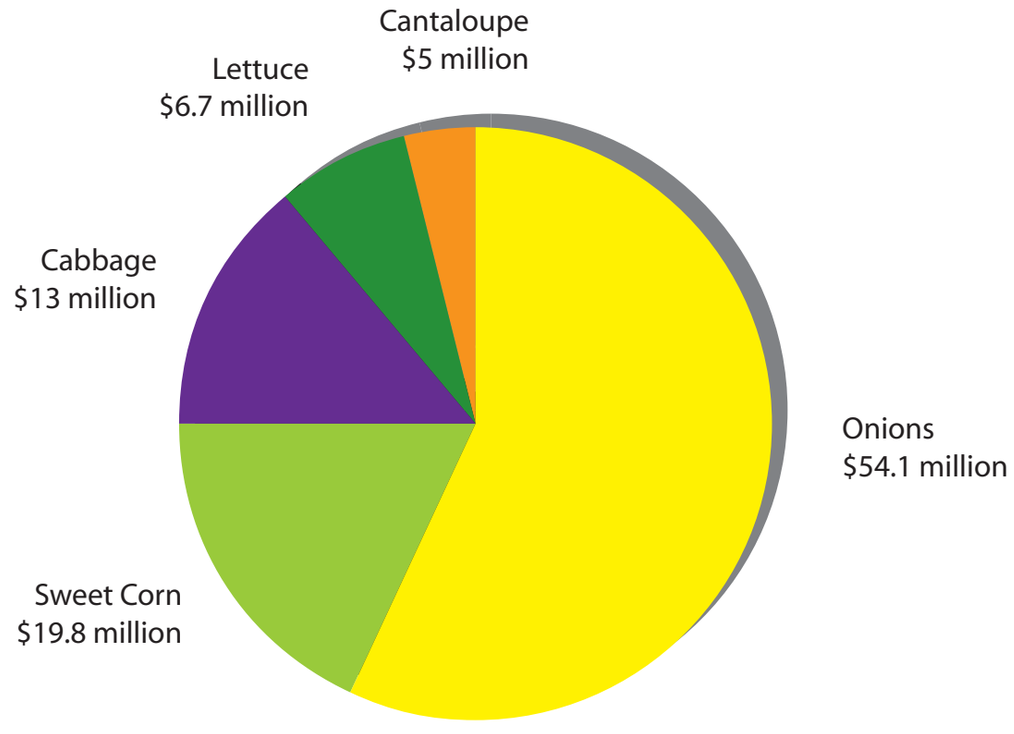
Onions

The onions that Colorado is known for are called dry bulb storage onions. These are the large yellow, white and red onions found at your supermarket.

Onions were the highest ranked vegetable in both value and production in Colorado during 2006. This crop totaled 360 million pounds with an estimated value of $54.1 million. Harvest for onions is from August through October. Storage is good through March of the following year. This provides a steady supply for most of the year.

Dry, sweet onions from Colorado are ideal for long storage because of their low moisture content. Colorado ranks sixth in the nation for onion production.

Onions are fat free, very low in sodium, a good source of fiber and high in vitamin C.



Colorado Vegetable Crops - 2006
Value of Production

Sweet Corn

In Colorado, during 2005, sweet corn's value ranked second among vegetables produced, and second in total production. 140 million pounds were produced on 9,000 acres. The value of the 2006 crop was $19.8 million. Sweet corn can be found fresh in Colorado from mid-July through September.

Sweet corn is sodium free, low fat, high in fiber and a good source of Vitamin C. Colorado ranks sixth in sweet corn production in the United States.

Cabbage

Colorado cabbage ranked third in production and third in value. Colorado production for 2006 was 130 million pounds. The value of production was $13.1 million–a little lower than 2005.

Cabbage is harvested in Colorado from end of June through mid-November.

Several studies suggest that eating cabbage lowers the risk of getting cancer. It contains many nutritious vitamins and minerals.

Lettuce

Lettuce had the fourth highest vegetable production in Colorado during 2006. It also ranked fourth in value of production. 44 million pounds were produced with a value of $6.7 million. Growers received an average of 15 cents per pound sold.

Colorado is the nation's third largest lettuce producer. Fresh Colorado leaf and head lettuce can be found at your local store from June through October.

Cantaloupe

Cantaloupe ranked fifth in both production and value in Colorado in 2006. 1,600 acres were harvested and production was 27.2 million pounds. Value was $5 million with the average price received by the farmer at 18.4 cents per pound.

Our state is famous for the cantaloupe grown in Rocky Ford, Colorado. Rocky Ford was once considered the "Melon Capital of the World. Harvest occurs from August through mid-October each year.

Cantaloupe is very low in sodium, fat free and is high in vitamins A and C.

The *Colorado Reader* publication and Ag in the Classroom are projects of the Colorado Foundation for Agriculture. Educational projects are produced in cooperation with the Colorado Department of Agriculture, other state and federal agencies, Colorado commodity groups, Colorado agricultural associations, state universities and colleges and interested individuals. *Colorado Readers* are provided free to educators requesting them. For more information contact: Bette Blinde, Director, Colorado Foundation for Agriculture, P.O. Box 10, Livermore, CO 80536 or phone (970) 881-2902. Financial support for this reader has been graciously provided by USDA. Written by Carrie Jordan. Illustrated and designed by Carrie Jordan

COLORADO CONTENT STANDARDS COVERED IN THIS READER:

ECONOMICS

Standard II - Students understand how different economic systems impact decisions about the use of resources and the production and distribution of goods and services.

GEOGRAPHY

Standard I - Students know how to use and construct maps, globes, and other geographic tools to locate and derive information about people, places, and environments.

Standard II - Students know the physical and human characteristics of places, and use this knowledge to define and study regions and their patterns of change.

MATHEMATICS

Standard II - Students will apply algebraic and/or other mathematical methods to understand and explore models, data, graphs, patterns, functions, and spatial relationships.

Standard III - Students will use mathematical strategies, data collection and analysis, statistics, and probability in everyday life situations.

Standard VII - Students will communicate the reasoning used in problem-solving situations.

READING AND WRITING

Standard I - Students read, listen to, and understand a variety of materials.

Standard II - Students write and speak for a variety of purposes and audiences.

Standard III - Students write using conventional grammar, usage, sentence structure, punctuation, capitalization, and spelling, and speak using conventional grammar, usage, sentence structure, and punctuation.

Standard IV - Students apply thinking skills to their reading, writing, speaking, listening, and viewing.

SCIENCE

Standard III - Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.

Agriculture Word Search

R S S G E C J C L Y O P N P E
E E L E U P O Z S E O U R N S
W E F R L R U T A T T O Y P U
O D X M N P O O A P D T N E O
L S A I Y R P T L U L U U A H
F O R N R X O A C A R C E C N
Y S E A O E X T I S T U B H E
C E C T S I I C E Z L N F E E
O O V I F O E R U A M A A S R
L T S O N P Y F V P T Z W C G
O A Y N S E L B A T E G E V K
R M V K N L A S P A R A G U S
A O T R I L O C C O R B R S Z
D T V Q M W C A B B A G E S T
O S N O I N O G U F R U I T T

Word Bank:

APPLES
ASPARAGUS
BROCCOLI
CABBAGE
CANTALOUPE
CARROTS
COLORADO
CORN
FLOWER
FRUIT
GERMINATION
GREENHOUSE
LETTUCE
NURSERY
ONIONS
PEACHES
PEARS
POTATOES
PRODUCTION
SEEDS
SPECIALTY
TOMATOES
VALUE
VEGETABLES

THE TOP 3 COLORADO FRUITS

Peaches

The leading fruit crop in Colorado for the 2006 season was peaches. 28 million pounds of peaches were produced–valued at $17.03 million. In 2006, peach producers received an average price of 65.5 cents per pound.

Peaches bloom from April 5-April 25 and are harvested between August 5 and September 20. Warm summer days and cool nights help create the juicy peaches Colorado is famous for.

Delta and Mesa counties produce the most peaches in Colorado. More than 1/2 million peach trees are located in western Colorado.

Apples

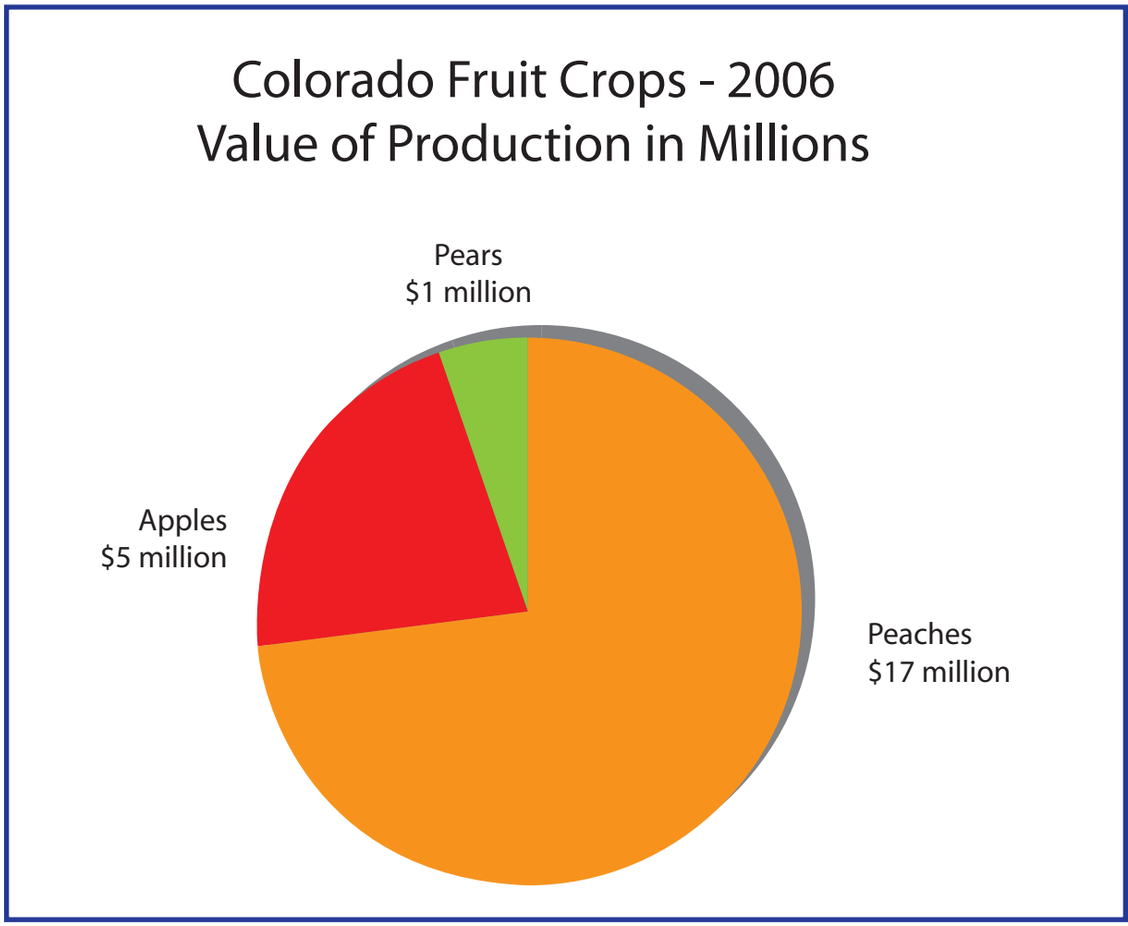
Apples ranked first in Colorado production but second in value for the 2006 crop. Total production was 15 million pounds, valued at $5.02 million. Growers were paid an average of 35.9 cents per pound.

Most Colorado apples are harvested in September, however you can find them from August through June. They can be stored through June 1st of the following year. Colorado's apples are primarily grown in Delta, Montrose and Mesa counties. Varieties include Red Delicious, Golden Delicious, Jonathan and Rome.

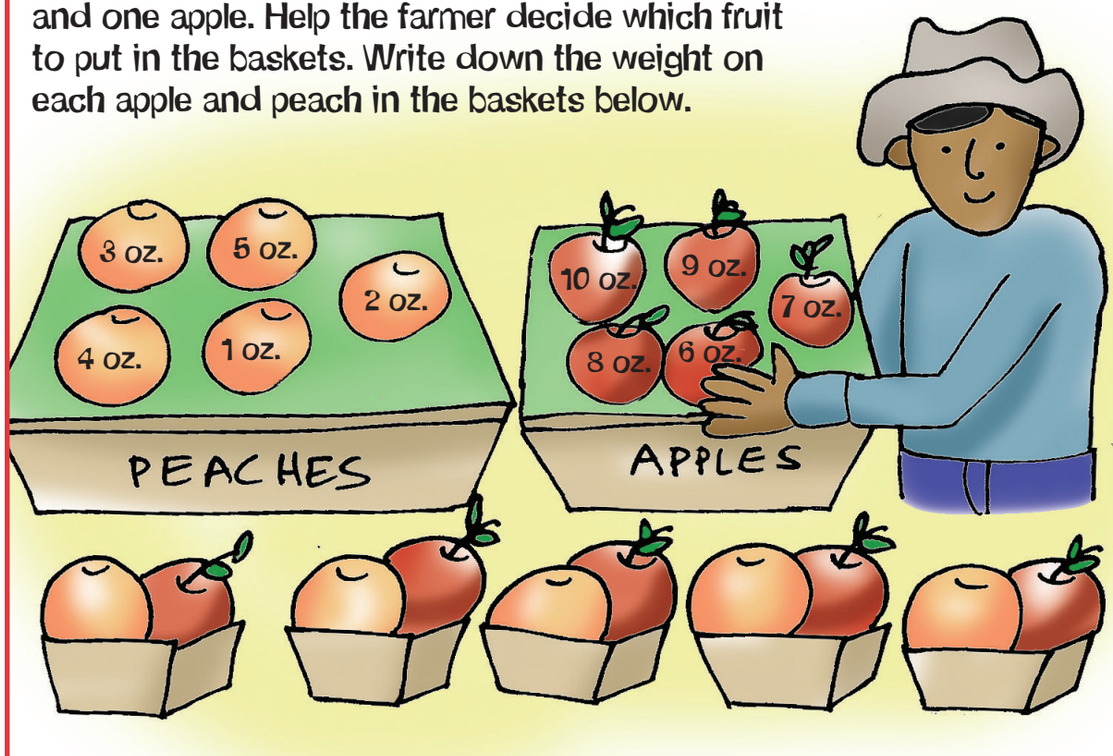
Colorado apples regularly win taste tests in supermarkets. Our high-altitude makes them taste better. Apples are sodium free, fat free and a good source of fiber.

Pears

The 2006 Colorado pear crop was 4.6 million pounds and was valued at $1.09 million. Producers received 27.09 cents per pound. Pear trees bloom April 20-May 5 and are harvested from August 10-September 20. The principle pear growing counties in Colorado are Mesa and Delta counties.

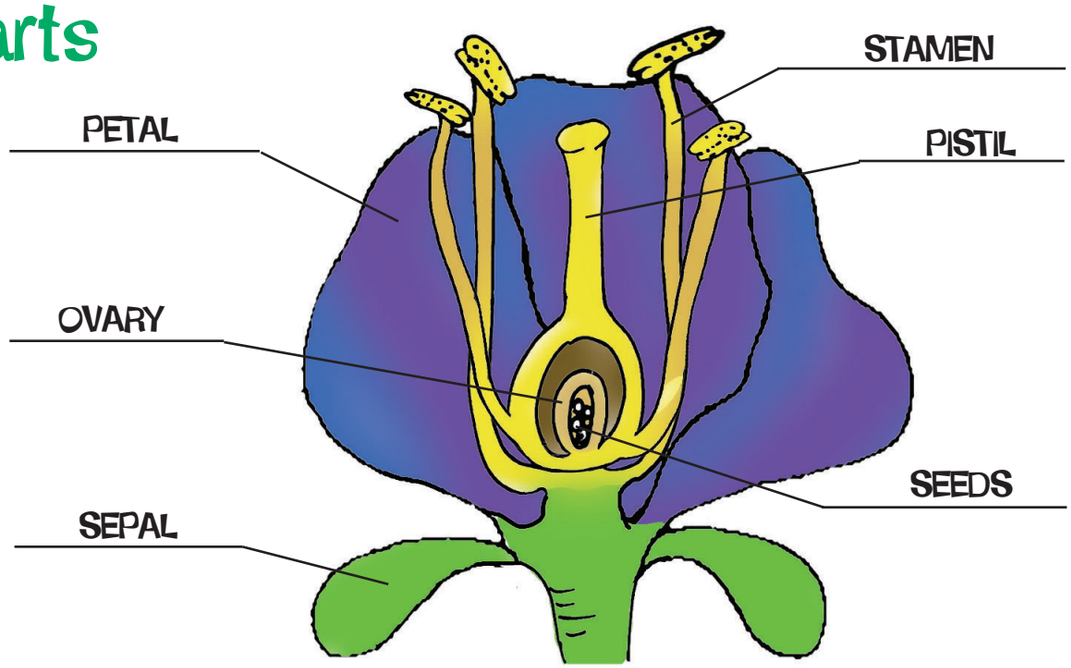


A peach and apple grower in Palisade, CO decided to give some of his fruit to his neighbors. His fruit varied in size, but the farmer wanted to make sure each neighbor got a basket that weighed exactly the same. Each basket needs to have one peach and one apple. Help the farmer decide which fruit to put in the baskets. Write down the weight on each apple and peach in the baskets below.



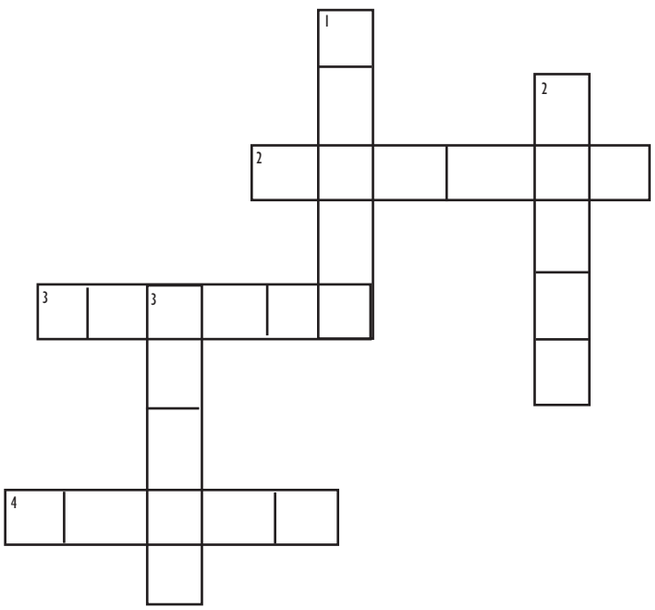
Flower Pieces & Parts

Plants reproduce by using flowers to lure bees inside. While the bees do this they rub against the pollen spores and collect pollen on their legs. When they go to another flower the pollen gets knocked of onto the flower which is then pollinated or fertilized. The fertilized plant then will start to grow pods or other seed casings with the seeds in them. The seeds then are transported by wind, water, animals, or humans to a new location.



WORD BANK:

PETAL, STAMEN, PISTIL, SEPAL, OVARY, SEEDS



Complete the crossword puzzle. Then use the words from the puzzle to label the flower parts.

ACROSS

2. The tall. thin part of a flower with a knobbed tip that holds the pollen.
3. The large center stalk, shaped like a water bottle.
4. The ball shaped lower part of the pistil holding young seeds.

DOWN

1. The brightly colored part of a flower.
2. A fertilized plant ovule containing an embryo.
3. The green part that surrounds the flower bud and extends from the base of a flower.

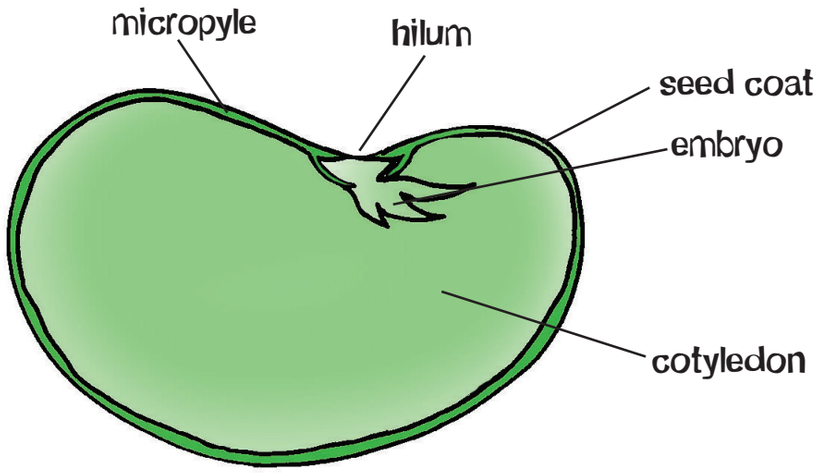
Greenhouse/Nursery Crops

Colorado grows a large variety of crops in greenhouses. Our greenhouse vegetables are grown under 4.2 million square feet of glass or plastic. Other crops include flowers such as: carnations, lilies, snapdragons and tulips. Some are potted flowering plants such as: african violets, easter lilies, roses and poinsettias. Other plants include: hanging baskets, herbs and flowers for transplantation into gardens. The value of these crops in 2005 in Colorado was $292 million.

Nursery crops are grown all over Colorado, but primarily in Adams, Boulder, Chaffee, Douglas, El Paso, Jefferson, La Plata, Larimer, Mesa, Montezuma, Morgan and Weld counties.

Greenhouse and nursery crops provide $1.1 billion to Colorado every year. 1,500 companies employ 12,200 people. Colorado ranks number one nationally in greenhouse tomato production, number two in rose and carnation production and number ten in total greenhouse production.

Anatomy of a Bean Seed



micropyle - the small pore in a seed that that allows water absorption

hilum - the scar on a seed coat at the location where it was attached to the plant's stalk during development

seed coat (testa) - the outer, protective skin covering the seed

embryo - developing plant still inside the seed

cotyledon - part of the seed that contains stored food used for initial growth

Examining a Bean Seed

Materials:
Dried lima beans, paper plates, water, magnifying glasses

Prep:
On the day before starting the experiment, soak dried lima beans in water. They will absorb some of the water and get a soft outside covering (seed coat).

Directions:
1. Give each student a lima bean on a paper plate. Identify the seed coat.
2. Carefully rub the seed between your thumb and fingers. The seed coat will crack and slip off the seed easily.
3. Identify the cotyledon. This is the large oval part of the seed containing the food the seed needs before it can get nutrients for the soil and water.
4. The bean seed has a slit going down the middle of the seed. Split it open into 2 halves. Inside is a tiny plant called an embryo. A bean seed has two parts. Therefore, it is a dicotyledon, or dicot for short.
5. Observe the bean parts using a magnifying glass.

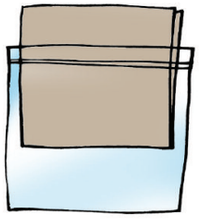
Hydroponic Seed Germination

Hydroponic means growing plants without soil. In Colorado some tomatoes and lettuce are grown without soil in greenhouses. The water solution they grow in provides the nutrients the soil normally would.

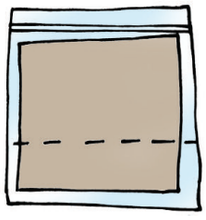
Materials:
Ziploc plastic bags, paper towels, Lima beans (beans), masking tape, markers, pencils, a cup, stapler, writing paper, water

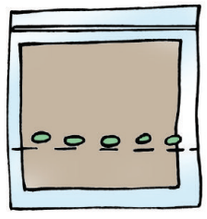
Prep:
To prevent mold, dip the seeds in a diluted bleach solution for 15 seconds (1 tablespoon bleach to 1 quart of water). Don't rinse before putting in the bags.

Directions:
1. Give each student a ziplock plastic bag with their name written on the masking tape.

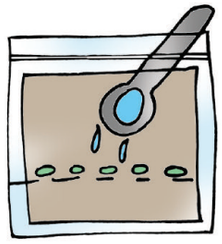


2. Give one sheet of paper towel to each student. Fold the paper towel so it fits inside the ziploc bag.
3. Staple across the bag and through the paper towels about 1 inch from the bottom of the bag.

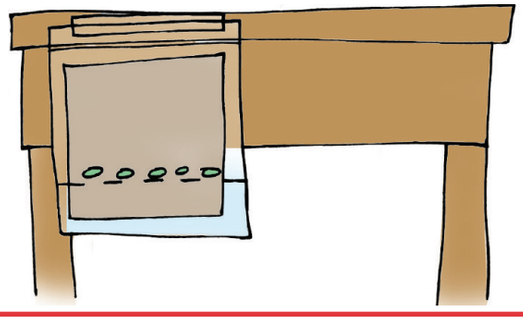




3. Give each student five lima beans. Position the beans spread out above the staples.
4. Add 3 tablespoons of water to the bag, soaking the paper towel.



5. Close the bag and hang from a desk making sure the bag isn't in direct sunlight.
6. As the seeds sprout, students will write and draw a picture of the seed growth each day.



Do not plant the seeds when done, throw away the bag with seeds in it.